

We Claim:

1. A method for operating an MRAM semiconductor memory configuration containing a memory cell array having a multiplicity of TMR memory cells with first ends connected to bit lines and second ends connected to word lines, which comprises the steps of:

storing information in a soft-magnetic layer of a respective TMR memory cell;

during reading, detecting initially a current signal in a respective bit line without an externally applied magnetic field;

afterwards, applying a current pulse through an electrically non-connected word line, a magnetization of the soft-magnetic layer being reversibly rotated relative to an easy magnetization axis thereof and alters the current signal resulting in an altered current signal;

comparing the altered current signal in the respective bit line, being altered as a result of the current pulse, with the current signal previously detected; and

determined a content of the information stored from results of the comparing step.

2. The method according to claim 1, which further comprises setting a rotation of the magnetization of the soft-magnetic layer relative to the easy magnetization axis which is effected by the current pulse to about 45 to 60°.

3. A method for operating an MRAM semiconductor memory configuration containing a memory cell array having a multiplicity of TMR memory cells with first ends connected to bit lines and second ends connected to word lines, which comprises the steps of:

storing information in a hard-magnetic layer of a TMR memory cell;

applying a current pulse through an electrically non-connected write line for bringing a soft-magnetic layer into a defined direction parallel to an easy magnetization axis;

subsequently measuring a current signal that has been altered as a result of the current pulse and resides in a bit line resulting in a measured value;

comparing the measured value with a value representative of the current signal in a case of an exactly opposite orientation of the soft-magnetic layer; and

determining a value of the information of the TMR memory cell from results of the comparing step.